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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

OJURONGBE, OLATUNDE S

ART UNIT

PAPER NUMBER

4145

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/583,463	Applicant(s) KIUCHI ET AL.	
	Examiner OLATUNDE S. OJURONGBE	Art Unit 4145	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>20060619</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

1. Claims **6-7 and 12-20** are objected to because of the following informalities: The limitations of the claims are directed to weight proportions with actual values expressed in mass; although terms, such as “mass” and “weight” are used interchangeably in the art, for claim language consistency, it is advisable that the applicant uses only one of the two terms in the claims. Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

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under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. **Claims 1-5 and 11** are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al (JP 2003-192925, see US 2005/0143502 for English Language equivalent).

Regarding **claims 1 and 5**, Yamada et al discloses a flame-retardant [0001, lines 1-2] thermoplastic resin composition [see composition and aliphatic polyester, 0014, lines 1-4] comprising at least a resin (A) [see polylactic acid, 0015, lines 1-3] and a flame retardant (B) [0018, lines 1-4], wherein the weight proportions of the individual components in the flame-retardant thermoplastic resin composition are:

$30 \leq W_1 < 55.5$ [see 48, Polylactic acid, example 16, Table 5, 0099]

$44.5 < X_1 \leq 70$ [see 50, Aluminum hydroxide, example 16, Table 5, 0099]

wherein W_1 is the percentage by mass of the resin (A) [see Polylactic acid, example 16, Table 5, 0099] and X_1 is the percentage by mass of the flame retardant (B) [see Aluminum hydroxide, example 16, Table 5, 0099], and 90% by mass or more of the flame retardant (B) is composed of a metal hydrate [see hydroxide compound having a purity of 99.5% or more, 0018, lines 1-4 and aluminum hydroxide 0045, lines 15-16] containing an alkali metal-based substance [see T-Na₂O and S-Na₂O, 0045, line 14].

In example 16, Table 5, Yamada et al discloses a composition comprising 48 parts by weight of polylactic acid and 50 parts by weight of aluminum hydroxide, these values anticipate $30 \leq W_1 < 55.5$ and $44.5 < X_1 < 70$ of the instant claim respectively.

Though Yamada et al does not explicitly disclose the metal hydrate (aluminum hydroxide) containing the alkali metal based substance (T-Na₂O and S-Na₂O) in an amount of 0.2% by mass or less, Yamada et al further discloses the alkali metal based substance (T-Na₂O and S-Na₂O) as impurity contained in the metal hydrate [0045, lines 12-14] and that the purity of the metal hydrate (hydroxide compound) is preferably about 99.5% or more [0045, lines 1-3], which makes the amount of alkali metal based substance contained in the metal hydrate about 0.5% or less.

According to Yamada et al, a purity of about 99.5% is preferred for the metal hydrate (hydroxide compound) because the shelf stability of the metal hydrate is improved with a higher purity of the metal hydrate [0045, lines 1-5]; hence it would have been obvious to one of ordinary skill in the art at the time the invention was made to have purified the metal hydrate thereby reducing the amount of alkali metal based substance contained in the metal hydrate in order to have an improved shelf stability of the metal hydrate.

The amount of alkali metal based substance contained in the metal hydrate of the flame retardant thermoplastic resin composition is not considered to confer patentability to the claim; as the purity, shelf stability and cost of purification of the metal hydrate are variables that can be modified, among others, by adjusting said amount of alkali metal based substance contained in the metal hydrate, with said purity, shelf stability and cost

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of purification of the metal hydrate increasing as the amount of alkali metal based substance (impurity) removed from the metal hydrate increases, hence, the amount of alkali metal based substance contained in the metal hydrate decreases; the precise amount of alkali metal based substance contained in the metal hydrate would have been considered a result effective variable by one having ordinary skill in the art at the time the invention was made. As such, without showing unexpected results, the claimed amount of alkali metal based substance contained in the metal hydrate cannot be considered critical. Accordingly, one of ordinary skill in the art at the time the invention was made would have optimized, by routine experimentation, the amount of alkali metal based substance contained in the metal hydrate of the flame-retardant thermoplastic resin composition of Yamada et al to obtain the desired balance between purification cost and the shelf stability of the metal hydrate (In re Boesch, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980)), since it has been held that where the general conditions of the claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (In re Aller, 105 USPQ 223).

Though modified Yamada et al does not disclose that the resin (A) is a plant-derived resin, this limitation is a product by process limitation and the examiner notes that even though a product-by-process is defined by the process steps by which the product is made, determination of patentability is based on the product itself. In re Thorpe, 777 F.2d 695, 227 USPQ 964 (Fed. Cir. 1985). As the court stated in Thorpe, 777 F.2d at 697, 227 USPQ at 966 (The patentability of a product does not depend on its method of production. In re Pilkington, 411 F.2d 1345, 1348, 162 USPQ 145, 147 (CCPA 1969).

If the product in a product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.).

Regarding **claims 2, 4, 9 and 11**, Yamada et al discloses a flame-retardant [0001, lines 1-2] thermoplastic resin composition[see composition and aliphatic polyester, 0014, lines 1-4] comprising at least a resin (A) [see polylactic acid, 0015, lines 1-3], a flame retardant (B) [0018, lines 1-4] and an aromatic ring-containing compound (C) [see bisphenol A, 0041, line 3] wherein the weight proportions of the individual components in the flame-retardant thermoplastic resin composition are:

$$25 \leq W_2 < 55.5 \text{ [see 48, Polylactic, example 16, Table 5, 0099]}$$

$$39.5 \leq X_2 \leq 70 \text{ [see 50, Aluminum hydroxide, example 16, Table 5, 0099]}$$

$$10 < Y < 35 \text{ [see bisphenol A, 0041, line 3 and silica compound, 0048, lines 14-17]}$$

wherein W_2 is the percentage by mass of the resin (A) [see 48, Polylactic, example 16, Table 5, 0099], X_2 is the percentage by mass of the flame retardant (B) [see 50, Aluminum hydroxide, example 16, Table 5, 0099], and Y is the percentage by mass of the aromatic ring- containing compound (C) [see bisphenol A, 0041, line 3 and silica compound, 0048, lines 14-17] and 90% by mass or more of the flame retardant (B) is composed of a metal hydrate[see hydroxide compound having a purity of 99.5% or more, 0018, lines 1-4 and aluminum hydroxide 0045, lines 15-16] containing an alkali metal-based substance [see T- Na_2O and S- Na_2O , 0045, line 14].

In example 16, Table 5, Yamada et al discloses a composition comprising 48 parts by weight of polylactic acid and 50 parts by weight of aluminum hydroxide, these values anticipate $30 \leq W_2 < 55.5$ and $44.5 < X_2 < 70$ of the instant claim respectively.

Yamada et al discloses that one or more flame retardant additives can be used in the invention [0035, lines 1-10].

Though Yamada et al does not disclose the resin composition comprising the bisphenol A in a disclosed amount, Yamada et al further discloses silica and bisphenol A as equivalents [see examples of organic flame retardant compounds, 0041, lines 1-6] and the weight proportion of silica in the resin composition [0048, lines 14-17]; since silica and bisphenol A are equivalents, one of ordinary skill in the art would have used either silica or bisphenol A in the disclosed weight proportion [10 to 35%, 0048, lines 14-17] in the thermoplastic resin composition of Yamada et al; such combination would have amount to nothing more than the use of a known element for its intended use in a known environment to accomplish entirely expected result.

Bisphenol A is an aromatic ring containing compound with two phenol.

However, modified Yamada et al does not disclose the weight proportion of the aromatic ring containing compound (C) (bisphenol A) in the flame-retardant thermoplastic resin composition as $0.5 \leq Y \leq 20$; wherein Y is the percentage by mass of the aromatic ring containing compound (C).

Modified Yamada et al further discloses that the mechanical strength of the flame retardant thermoplastic resin composition is affected by the amount of the flame retardant additive, including bisphenol A, added to the composition [0048, lines 1-4],

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therefore, the weight proportion of the aromatic ring containing compound (c) (bisphenol A) is not considered to confer patentability to the claims; as the strength of the resin composition is a variable that can be modified, among others, by adjusting said weight proportion of the aromatic ring containing compound (C) in the resin composition, with said strength of the resin composition increasing as the amount of the aromatic ring containing compound (C) decreases; the precise weight proportion of the aromatic ring containing compound (C) would have been considered a result effective variable by one having ordinary skill in the art at the time the invention was made. As such, without showing unexpected results, the claimed weight proportion of the aromatic ring containing compound (C) cannot be considered critical. Accordingly, one of ordinary skill in the art at the time the invention was made would have optimized, by routine experimentation, the weight proportion of the aromatic ring containing compound (C) in the flame retardant thermoplastic resin composition of modified Yamada et al to obtain the desired strength of the flame retardant thermoplastic resin composition (In re Boesch, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980)), since it has been held that where the general conditions of the claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (In re Aller, 105 USPQ 223).

Though modified Yamada et al does not explicitly disclose the metal hydrate (aluminum hydroxide) containing the alkali metal based substance (T- Na_2O and S- Na_2O) in an amount of 0.2% by mass or less, modified Yamada et al further discloses the alkali metal based substance (T- Na_2O and S- Na_2O) as impurity contained in the

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metal hydrate [0045, lines 12-14] and that the purity of the metal hydrate (hydroxide compound) is preferably about 99.5% or more [0045, lines 1-3], which makes the amount of alkali metal based substance contained in the metal hydrate about 0.5% or less.

According to modified Yamada et al, a purity of about 99.5% is preferred for the metal hydrate (hydroxide compound) because the shelf stability of the metal hydrate is improved with a higher purity of the metal hydrate [0045, lines 1-5]; hence it would have been obvious to one of ordinary skill in the art at the time the invention was made to have purified the metal hydrate thereby reducing the amount of alkali metal based substance contained in the metal hydrate in order to improve the shelf stability of the metal hydrate .

The amount of alkali metal based substance contained in the metal hydrate of the flame retardant thermoplastic resin composition is not considered to confer patentability to the claim; as the purity, shelf stability and cost of purification of the metal hydrate are variables that can be modified, among others, by adjusting said amount of alkali metal based substance contained in the metal hydrate, with said purity, shelf stability and cost of purification of the metal hydrate increasing as the amount of alkali metal based substance (impurity) removed from the metal hydrate increases, hence, the amount of alkali metal based substance contained in the metal hydrate decreases; the precise amount of alkali metal based substance contained in the metal hydrate would have been considered a result effective variable by one having ordinary skill in the art at the time the invention was made. As such, without showing unexpected results, the

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claimed amount of alkali metal based substance contained in the metal hydrate cannot be considered critical. Accordingly, one of ordinary skill in the art at the time the invention was made would have optimized, by routine experimentation, the amount of alkali metal based substance contained in the metal hydrate of the flame retardant thermoplastic resin composition of modified Yamada et al to obtain the desired balance between purification cost and the shelf stability of the metal hydrate (In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980)), since it has been held that where the general conditions of the claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (In re Aller, 105 USPQ 223).

Though modified Yamada et al does not disclose that the resin (A) is a plant-derived resin, this limitation is a product by process limitation and the examiner notes that even though a product-by-process is defined by the process steps by which the product is made, determination of patentability is based on the product itself. In re Thorpe, 777 F.2d 695, 227 USPQ 964 (Fed. Cir. 1985). As the court stated in Thorpe, 777 F.2d at 697, 227 USPQ at 966 (The patentability of a product does not depend on its method of production. In re Pilkington, 411 F.2d 1345, 1348, 162 USPQ 145, 147 (CCPA 1969). If the product in a product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.).

Regarding **claims 3, 8 and 10**, Yamada et al discloses a flame-retardant [0001, lines 1-2] thermoplastic resin composition[see composition and aliphatic polyester,

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0014, lines 1-4] comprising at least a resin (A) [see polylactic acid, 0015, lines 1-3], a flame retardant (B) [0018, lines 1-4], an aromatic ring-containing compound (C) [see bisphenol A, 0041, line 3] and a nucleating agent (D) [see compounds containing phosphorus, 0037, lines 1-18] wherein the weight proportions of the individual components in the flame-retardant thermoplastic resin composition are:

$$25 \leq W_3 < 55.5 \text{ [see 48, Polylactic, example 16, Table 5, 0099]}$$

$$29.5 \leq X_3 \leq 70 \text{ [see 50, Aluminum hydroxide, example 16, Table 5, 0099]}$$

$$10 < Y < 35 \text{ [see bisphenol A, 0041, line 3 and silica compound, 0048, lines 14-17].}$$

And $2 \leq Z \leq 20$ [see compounds containing phosphorus, 0037, lines 1-18 and ammonium polyphosphate, 0048, lines 9-13].

wherein W_3 is the percentage by mass of the resin (A) [see 48, Polylactic, example 16, Table 5, 0099], X_3 is the percentage by mass of the flame retardant (B) [see 50, Aluminum hydroxide, example 16, Table 5, 0099], Y is the percentage by mass of the aromatic ring-containing compound (C) [see bisphenol A, 0041, line 3 and silica compound, 0048, lines 14-17] and Z is the percentage by mass of the nucleating agent (D) [see compounds containing phosphorus, 0037, lines 1-18 and ammonium polyphosphate, 0048, lines 9-13], and 90% by mass or more of the flame retardant (B) is composed of a metal hydrate [see hydroxide compound having a purity of 99.5% or more, 0018, lines 1-4 and aluminum hydroxide 0045, lines 15-16] containing an alkali metal-based substance [see T- Na_2O and S- Na_2O , 0045, line 14].

In example 16, Table 5, Yamada et al discloses a composition comprising 48 parts by weight of polylactic acid and 50 parts by weight of aluminum hydroxide, these values anticipate $30 \leq W_3 < 55.5$ and $44.5 < X_3 < 70$ of the instant claim respectively.

Though Yamada et al does not explicitly disclose the compounds containing phosphorous as nucleating agents, since the instant application discloses organic compounds of phosphorus acid and phosphoric acid as nucleating agents [instant specification 0050, lines 55-56], then phosphoric esters, tris(chloroethyl)phosphate and other organic compounds of phosphorus acid and phosphoric acid as disclosed by Yamada et al [0037, lines 1-18] act as nucleating agents in the flame retardant thermoplastic resin composition of Yamada et al, as a chemical composition and its properties are inseparable. Therefore, if the prior art teaches the identical chemical structure, the properties applicant discloses and/or claims are necessarily present. In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990)

Though Yamada et al does not disclose the thermoplastic resin composition comprising the bisphenol A in a disclosed amount, Yamada et al further discloses silica and bisphenol A as equivalents [see examples of organic flame retardant compounds, 0041, lines 1-6]; and the weight proportion of silica in the thermoplastic resin composition [0048, lines 14-17]. Since silica and bisphenol A are equivalents, one of ordinary skill in the art would have used either silica or bisphenol A in the disclosed weight proportion [10 to 35%, 0048, lines 14-17] in the thermoplastic resin composition of Yamada et al; such combination would have amount to nothing more than the use of

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a known element for its intended use in a known environment to accomplish entirely expected result.

Though modified Yamada et al does not disclose the flame resistant thermoplastic resin composition comprising organic compounds of phosphorous and phosphoric acid in a disclosed amount, modified Yamada et al further discloses ammonium polyphosphate and various organic compounds of phosphorus acid and phosphoric acid as equivalents [0037, lines 3 and lines 10-11]; and the weight proportion of ammonium polyphosphate in the thermoplastic resin [0048, lines 9-13], one of ordinary skill in the art would have used ammonium polyphosphate or any of the organic compounds of phosphorus acid and/or phosphoric acid in the disclosed weight proportion [2 to 20%, 0048, lines 9-13] in the thermoplastic resin composition of modified Yamada et al; such combination would have amount to nothing more than the use of a known element for its intended use in a known environment to accomplish entirely expected result.

Though modified Yamada et al does not disclose the fire retardant thermoplastic resin composition comprising an aromatic ring containing compound (C) in the weight proportion of $0.5 \leq Y \leq 20$ and the nucleating agent (D) in the weight proportion of $0.05 \leq Z \leq 20$, Wherein Y is the percentage by mass of the aromatic containing compound (C) and Z is the percentage by mass of the nucleating agent (D); modified Yamada et al further discloses that the mechanical strength of the flame retardant thermoplastic resin composition is affected by the amount of the flame retardant additive, including bisphenol A and organic compounds of phosphorous and/or phosphoric acid, added to the composition [0048, lines 1-4].

The weight proportion of the bisphenol A (aromatic ring containing compound (c)) and the organic compound of phosphorous acid and/or phosphoric acid (nucleating agent (D)) in the flame retardant thermoplastic resin composition are not considered to confer patentability to the claim; as the strength of the resin composition is a variable that can be modified, among others, by adjusting said weight proportion of the bisphenol A (aromatic ring containing compound (C)) and the organic compound of phosphorous acid and/or phosphoric acid (nucleating agent (D) in the thermoplastic resin composition, with said strength of the flame resistant thermoplastic resin composition increasing as the amount of the bisphenol A (aromatic ring containing compound (C)) and organic compound of phosphorous acid and /or phosphoric acid (nucleating agent (D)) decreases; the precise weight proportion of the bisphenol A (aromatic ring containing compound (C)) and the organic compound of phosphorous acid and/or phosphoric acid (nucleating agent (d)) would have been considered a result effective variable by one having ordinary skill in the art at the time the invention was made. As such, without showing unexpected results, the claimed weight proportion of the bisphenol A (aromatic ring containing compound (C)) and the organic compound of phosphorous acid and/or phosphoric acid (nucleating agent (D)) cannot be considered critical. Accordingly, one of ordinary skill in the art at the time the invention was made would have optimized, by routine experimentation, the weight proportion of the bisphenol A (aromatic ring containing compound (C)) and organic compound of phosphorous acid and/or phosphoric acid (nucleating agent (D)) in the flame resistant thermoplastic resin composition of modified Yamada et al to obtain the desired strength

of the resin composition (In re Boesch, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980)), since it has been held that where the general conditions of the claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (In re Aller, 105 USPQ 223).

Though modified Yamada et al does not explicitly disclose the metal hydrate (aluminum hydroxide) containing the alkali metal based substance (T-Na₂O and S-Na₂O) in an amount of 0.2% by mass or less, Yamada et al further discloses the alkali metal based substance (T-Na₂O and S-Na₂O) as impurity contained in the metal hydrate [0045, lines 12-14] and that the purity of the metal hydrate (hydroxide compound) is preferably about 99.5% or more [0045, lines 1-3], which makes the amount of alkali metal based substance contained in the metal hydrate about 0.5% or less.

According to modified Yamada et al, a purity of about 99.5% is preferred for the metal hydrate (hydroxide compound) because the shelf stability of the metal hydrate is improved with a higher purity of the metal hydrate [0045, lines 1-5]; hence it would have been obvious to one of ordinary skill in the art at the time the invention was made to have purified the metal hydrate thereby reducing the amount of alkali metal based substance contained in the metal hydrate in order to have improved shelf stability of the flame retardant thermoplastic resin composition.

The amount of alkali metal based substance contained in the metal hydrate is not considered to confer patentability to the claims; as the purity, shelf stability and cost of purification of the metal hydrate are variables that can be modified, among others, by

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adjusting said amount of alkali metal based substance contained in the metal hydrate of the flame retardant thermoplastic resin composition, with said purity, shelf stability and cost of purification of the metal hydrate increasing as the amount of alkali metal based substance (impurity) removed from the metal hydrate increases, hence, the amount of alkali metal based substance contained in the metal hydrate decreases; the precise amount of alkali metal based substance contained in the metal hydrate would have been considered a result effective variable by one having ordinary skill in the art at the time the invention was made. As such, without showing unexpected results, the claimed amount of alkali metal based substance contained in the metal hydrate of the flame retardant thermoplastic resin composition cannot be considered critical.

Accordingly, one of ordinary skill in the art at the time the invention was made would have optimized, by routine experimentation, the amount of alkali metal based substance contained in the metal hydrate of the flame retardant thermoplastic resin composition of Yamada et al to obtain the desired balance between purification cost and the shelf stability of the metal hydrate (In re Boesch, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980)), since it has been held that where the general conditions of the claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (In re Aller, 105 USPQ 223).

Though modified Yamada et al does not disclose that the resin (A) is a plant-derived resin, this limitation is a product by process limitation and the examiner notes that even though a product-by-process is defined by the process steps by which the product is made, determination of patentability is based on the product itself. In re

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Thorpe, 777 F.2d 695, 227 USPQ 964 (Fed. Cir. 1985). As the court stated in Thorpe, 777 F.2d at 697, 227 USPQ at 966 (The patentability of a product does not depend on its method of production. In re Pilkington, 411 F.2d 1345, 1348, 162 USPQ 145, 147 (CCPA 1969). If the product in a product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.).

6. Claims **6 and 12-15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al (JP 2003-192925, see US 2005/0143502 for English Language equivalent) as applied to claims 1-5 respectively, in view of Honda et al (WO/2002/090440, see US 2004/0143068 for English Language equivalent).

Regarding **claims 6 and 12-15**, modified Yamada et al discloses all the claim limitations as set forth above and further discloses the flame-retardant thermoplastic resin composition, further comprising a drip-proof agent (E) (see Teflon, 0059, line 11). Teflon is a registered trademark for polytetrafluoroethylene.

Though modified Yamada et al does not disclose the polytetrafluoroethylene (Teflon) as a drip-proof agent; since polytetrafluoroethylene is disclosed in the instant application as a drip-proof agent [see instant application, 0055, lines 1-6], then Teflon (polytetrafluoroethylene) acts as a drip-proof agent in the invention of modified Yamada et al, because a chemical composition and its properties are inseparable. Therefore, if the prior art teaches the identical chemical structure, the properties applicant discloses

and/or claims are necessarily present. In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

Though modified Yamada et al does not disclose the drip-proof agent (E) in a weight proportion of 1% by mass or less to the total weight of the flame-retardant thermoplastic resin composition, modified Yamada et al further discloses that additives, including Teflon (polytetrafluoroethylene) can be added to the thermoplastic resin composition in an amount such that the desired effect of the composition of the invention is not sacrificed [0058, lines 1-4].

It is known in the art, as evidenced by Honda et al, that polytetrafluoroethylene has poor compatibility with thermoplastic resins, and it is difficult to uniformly disperse polytetrafluoroethylene in thermoplastic resins as an aggregate tends to be formed when polytetrafluoroethylene is dispersed in thermoplastic resins. The aggregate of polytetrafluoroethylene causes poor appearance and decreases the mechanical properties such as impact resistance of the thermoplastic resin composition [Honda et al, 0005, lines 1-14]

The weight proportion of the polytetrafluoroethylene (drip-proof agent) is not considered to confer patentability to the claims; as the impact resistance of the flame retardant thermoplastic resin composition is a variable that can be modified, among others, by adjusting said weight proportion of the polytetrafluoroethylene (drip-proof agent), with said impact resistance of the flame retardant thermoplastic resin decreasing as the weight proportion of the polytetrafluoroethylene (drip-proof agent) increases, the precise weight proportion of the polytetrafluoroethylene (drip-proof agent) would have

been considered a result effective variable by one having ordinary skill in the art at the time the invention was made. As such, without showing unexpected results, the claimed weight proportion of the polytetrafluoroethylene (drip-proof agent) cannot be considered critical. Accordingly, one of ordinary skill in the art at the time the invention was made would have optimized, by routine experimentation, the weight proportion of the polytetrafluoroethylene (drip-proof agent) in the flame retardant thermoplastic resin composition of modified Yamada et al to obtain the desired impact resistance of the flame retardant thermoplastic resin composition (In re Boesch, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980)), since it has been held that where the general conditions of the claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (In re Aller, 105 USPQ 223).

7. **Claims 7 and 16-19** are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al (JP 2003-192925, see US 2005/0143502 for English Language equivalent) as applied to claims 1-5 above, in view of Fujihana et al (WO 01/79354, see US 7,192,538 for English Language equivalent).

Regarding **claims 7 and 16-19**, modified Yamada et al discloses all the claim limitations as set forth above and further discloses the flame-retardant thermoplastic resin, further comprising a high-strength fiber (F) [see carbon fiber, 0059, line 2]. Though modified Yamada et al does not disclose the high-strength fiber in a weight proportion of 10% by mass or less to the total weight of the flame-retardant thermoplastic resin composition, modified Yamada et al further discloses that additives,

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including carbon fiber can be added to the thermoplastic resin composition in an amount such that the desired effect of the composition of the invention is not sacrificed [0058, lines 1-4].

It is well known in the art that carbon fiber when added to a thermoplastic resin composition imparts strength to the thermoplastic composition, however, it also affects the surface smoothness of the thermoplastic resin composition as evidenced by Fujihana et al (col.3, lines 22-25).

The weight proportion by mass of the carbon fiber (high-strength fiber) to the total weight of the flame-retardant thermoplastic composition is not considered to confer patentability to the claims; as the surface smoothness of the flame-retardant thermoplastic composition is a variable that can be modified, among others, by adjusting said the weight proportion by mass of the carbon fiber (high-strength fiber) in the flame-retardant thermoplastic composition, with said surface smoothness decreasing as the weight proportion by mass of the carbon fiber (high-strength fiber) increases, the precise weight proportion by mass of the carbon fiber (high-strength fiber) would have been considered a result effective variable by one having ordinary skill in the art at the time the invention was made. As such, without showing unexpected results, the claimed weight proportion by mass of the carbon fiber (high-strength fiber) cannot be considered critical. Accordingly, one of ordinary skill in the art at the time the invention was made would have optimized, by routine experimentation, the weight proportion by mass of the carbon fiber (high-strength fiber) in the flame-retardant thermoplastic composition of modified Yamada et al to obtain the desired

strength and surface smoothness of the flame retardant thermoplastic resin composition (In re Boesch, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980)), since it has been held that where the general conditions of the claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (In re Aller, 105 USPQ 223).

8. **Claim 20** is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al (JP 2003-192925, see US 2005/0143502 for English Language equivalent) in view of Honda et al (WO/2002/090440, see US 2004/0143068 for English Language equivalent) as applied to claim 6 above, in further view of Fujihana et al (WO 01/79354, see US 7,192,538 for English Language equivalent).

Regarding **claim 20**, modified Yamada et al discloses all the claim limitations as set forth above and further discloses the flame-retardant thermoplastic resin, further comprising a high-strength fiber (F) [see carbon fiber, 0059, line 2].

Though modified Yamada et al does not disclose the high-strength fiber in a weight proportion of 10% by mass or less to the total weight of the flame-retardant thermoplastic resin composition, modified Yamada et al further discloses that additives, including carbon fiber can be added to the thermoplastic resin composition in an amount such that the desired effect of the composition of the invention is not sacrificed [0058, lines 1-4].

It is well known in the art that carbon fiber when added to a thermoplastic resin composition imparts strength to the thermoplastic composition, however, it also affects

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the surface smoothness of the thermoplastic resin composition as evidenced by Fujihana et al (col.3, lines 22-25).

The weight proportion by mass of the carbon fiber (high-strength fiber) to the total weight of the flame-retardant thermoplastic composition is not considered to confer patentability to the claims; as the surface smoothness of the flame-retardant thermoplastic composition is a variable that can be modified, among others, by adjusting said the weight proportion by mass of the carbon fiber (high-strength fiber) in the flame-retardant thermoplastic composition, with said surface smoothness decreasing as the weight proportion by mass of the carbon fiber (high-strength fiber) increases, the precise weight proportion by mass of the carbon fiber (high-strength fiber) would have been considered a result effective variable by one having ordinary skill in the art at the time the invention was made. As such, without showing unexpected results, the claimed weight proportion by mass of the carbon fiber (high-strength fiber) cannot be considered critical. Accordingly, one of ordinary skill in the art at the time the invention was made would have optimized, by routine experimentation, the weight proportion by mass of the carbon fiber (high-strength fiber) in the flame-retardant thermoplastic composition of modified Yamada et al to obtain the desired strength and surface smoothness of the flame retardant thermoplastic resin composition (In re Boesch, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980)), since it has been held that where the general conditions of the claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (In re Aller, 105 USPQ 223).

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to OLATUNDE S. OJURONGBE whose telephone number is (571)270-3876. The examiner can normally be reached on Monday-Thursday, 7.15am-4.45pm, EST time, Alt Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Basia Ridley can be reached on (571) 272 1453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

O.S.O.

/Basia Ridley/
Supervisory Patent Examiner, Art Unit 4145